

REDISCOVERY OF *TILIA NEGLECTA* SPACH

HENRY K. SVENSON

Tilia neglecta has always been a questionable species of Linden. It was described in 1834 from "ambulacris Hort. Bot. Paris" and was stated to be of North American origin. The range is from Montreal to Washington and southward. Due to variability, and absence of a "type" with which the name could be correlated, it has remained one of the least tangible species in a taxonomically difficult



Fig. 1. Four views of *Tilia neglecta*, Sandy Neck, Cape Cod, Massachusetts.

genus. In *Rhodora* 72: 339-344. 1970, I described a "forest" of *Tilia neglecta* in a dune hollow on Cape Cod, Massachusetts (fig. 1), and reviewed its subspecific synonyms, but at that time I had not seen the fine treatment of the American species by G. N. Jones in Illinois Biological Monographs no. 39, 1968.

In the spring of 1970, on a visit to the herbarium of the *Jardin des Plantes* I found in the European folders a specimen of *T. neglecta* labeled in Spach's hand, dated 1834, and from the "Menagerie". Then, after making detailed sketches of this specimen, I went over to the western entrance of the zoological garden. Just a short distance within the gate and opposite the old viper pit, stood a gigantic weatherbeaten linden, which in its leaves corresponded exactly with the herbarium specimen, evidently the long-lost *Tilia neglecta*. There were no records, but Dr. H. Heine said that it was not a European linden, and suggested that the tree originated from seeds sent by Michaux, which would have produced flowers and fruit by 1834. From my visit in 1937 I remember vividly the rocky viper pit. These vipers are now in elegant quarters in the new reptile house, and the rocks are given over to some harmless snakes. The exhibit, I think, has suffered from wear, and there is a sign in French (a universal language) "Please do not throw stones at the snakes." At the opposite entrance of the "Menagerie" there is a large unlabeled tree of *T. heterophylla* of about the same vintage as *T. neglecta*.

In the summer of 1970 Dr. Heine made for me a fine series of herbarium specimens of the Menagerie tree (see fig. 2), showing foliage, flowers, and sprout growth. These I have given to the Gray Herbarium. They confirm in microscopic detail the *Tilia neglecta* specimen mentioned above, and Dr. Heine has labeled this tree as the "holotype". Accompanying the specimen to be retained by the Gray Herbarium, I have placed the detailed sketches I made of the 1834 specimen.

André Michaux (1746-1802) ranged far in the eastern United States. He had two stations for assembling seeds

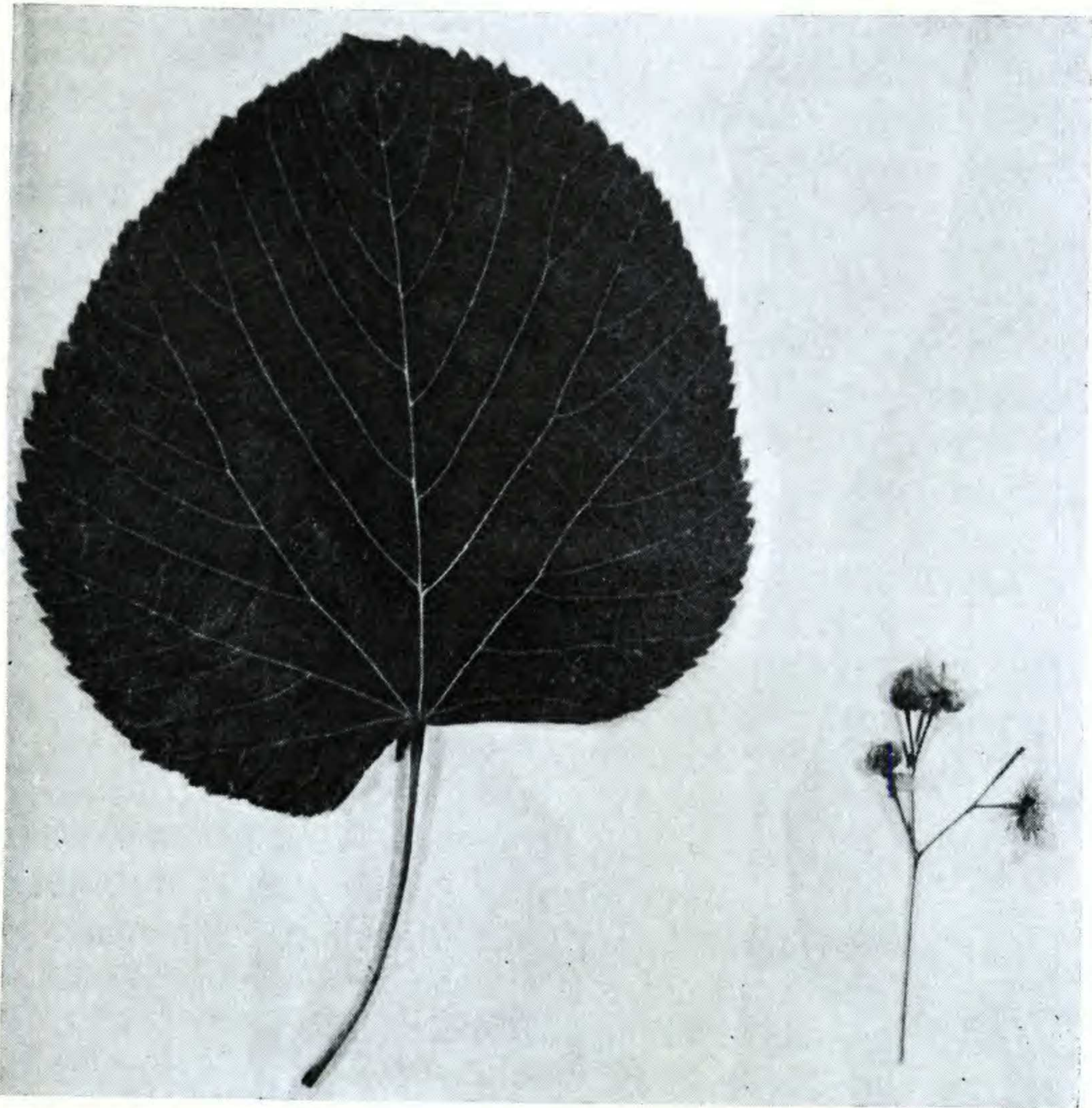


Fig. 2. Leaf (upper surface) and flower cluster from the type tree of *Tilia neglecta* (Jardin des Plantes, Paris), \times ca. 2/3 (actual size of leaf 11.5 \times 9.5 cm).

and roots; one at Charleston, South Carolina, the other on the east bank of the Hackensack River at New Durham in New Jersey. An account of the New Jersey garden, which covered 8 or 10 acres now occupied by the Hoboken Cemetery, is given by Rusby in Bull. Torrey Club 11: 88-90. 1884. Zenkert in Flora of the Niagara Frontier Region, 1934 says that the younger Michaux (1770-1855), having on his first expedition (1801-1803) traveled in the territory west of the Alleghenies, during the three years of his second journey explored the Atlantic Coastal States from Maine to Georgia and made five trips to the interior, one

of which, undertaken in 1806 or 1807, took him from New York to Lakes Ontario and Erie. The Michaux Herbarium at Paris consists of selected plants to illustrate the "Flora boreali-americana" published in 1803.

The Paris herbarium is also well represented by other early collectors. In addition to the Michaux Herbarium, there are four folders of American lindens, in which there are many Michaux specimens. I saw in the third folder the specimen collected by W. Riehl in Missouri, labeled as *T. neglecta* by Spach. It was sent to Jones and correctly annotated as *T. americana*. Among the early collectors are Tuckerman*, Pearson, Cooper, Torrey, Oakes, and others. In the European folders are three additional sheets of *T. neglecta*, so named by Spach "fleurs 12 juillet, 1850; fr. Sept. 1851; cultivée dans les promenades de Carlsruhe (grand duché de Baden)". There are also the varieties of *Tilia* published by A. Braun. Both the American and European collections would be well worth going over. For help at the Jardin des Plantes I am also greatly indebted to the Director, Dr. Jean Jacques Leroy, and to Dr. Alicia Lourteig who has charge of the Michaux Herbarium.

To return to a survey of American Literature on the subject, we find that Hough, Handbook of Trees . . . (1907, and reprint 1947), says that *T. Michauxii* is similar to *T. heterophylla*, and also confounded with *T. pubescens*

*Edward Tuckerman (1817-1886) a graduate of Union College in Schenectady, was the first, and I think the only curator of their herbarium. In his fine classification of the genus *Carex*, published in Schenectady and dedicated to John Torrey, he mentions himself as "Mus. et Herb. Concord Cur.". While I was teaching at Union, I came upon a trunk or two filled with Tuckerman specimens, and wrote an account of Tuckerman in the Union Alumni Bulletin (about 1924). The plants consisted primarily of collections by Jonathan Pearson and Lewis Beck from the Schenectady region; plants collected by Tuckerman in Europe, chiefly in the Epping Forest of England; and a large series of European plants given to him by Grisebach. Of Tuckerman's *Carices* and other interesting plants of eastern America, I found none, and suppose that he took these collections with him on leaving Union. I understand that the Union College Herbarium is now dismantled.

Aiton, and not well understood. *T. neglecta* is not treated by Deam in Flora of Indiana, but L. Braun in The Woody Plants of Ohio (1961) publishes a map, and considers it "a wide-ranging species or species-complex, perhaps intermediate between *T. americana* and *T. heterophylla*, but not synonymous with either." House in Annotated list of the ferns and flowering plants of New York State, 1924, mentions *T. neglecta* as frequent in central New York; the lower Hudson River Valley, Long Island, and Staten Island. Wiegand and Eames in Flora of the Lake Cayuga Basin, New York, 1926, always careful in their judgments, note that "the pubescence on the lower surface of the leaf is highly variable, and on it several species have been founded. The pubescence, though always close, fluctuates very gradually in density, and no other structural characters occur. It seems better, therefore, to recognize this closely pubescent form as simply a variety, *T. americana* var. *heterophylla* Loudon. Sargent's *T. neglecta* is transitional to typical *T. americana*". Jones' detailed treatment recognizes only three species in eastern United States: *T. americana*, *T. heterophylla*, and *T. caroliniana*. Sargent, in Bot. Gaz. 66: 494-496. 1918 states "I now consider *T. neglecta* to have been the *T. Michauxii* of Nuttall, which is the *T. argentea* of Michaux . . . The pubescence on the lower surface of the leaves is so constant and so persistent throughout the season, it seems best to consider it a species rather than a pubescent form of *T. glabra*. The base of the style in *T. neglecta* is furnished with long hairs, and that of *T. glabra* appears to be quite glabrous".

In the Paris tree the petals are 7.5×3 mm with narrowed base; the staminodia about $4.0-4.5 \times 1.0$ mm. In a microscopic comparison of the Cape Cod and Paris material, we see that the calyx is of the same shape, but in the Paris specimen the pubescence is not dense. Pedicels are thin and elongate, about 10×0.5 mm (see fig. 2) in the Paris material; but in the Cape Cod specimens densely stellate and about $4-5 \times 0.7$ mm. For pubescence of the under surface of the leaf, I have gone over the Cape Cod

material more carefully. Under a magnification of $40\times$, boiled fragments 2 mm square were cut with a razor blade directly on the 0.5 mm grid eyepiece. Simple hairs could then be readily counted for 1 sq. mm. The count of hairs or trichomes from an area, not dense, for 5 mm. square of lower leaf surface: 4-pronged 15-38 (10-25%); 3-pronged 1-6 (1-5%); 2-pronged (Malpighian) 6-10 (1%); 6-8-pronged (none); simple 100-150 (90%). This analysis (cf. the footnote on p. 343 of *Rhodora*, vol. 72) shows that there is a considerable amount of variation.

For the Paris tree (in several counts) there was an average of about 375 hairs on 5×5 mm of lower leaf surface: 4-pronged (5%); 3-pronged (1%); 2-pronged (3%); 5-pronged (less than 1%); simple (90%). In this Paris material the 2-pronged hairs are merely bifurcate; the simple hairs are mainly set at an angle on the veins, giving the veins a fuzzy appearance, whereas in the Cape Cod material the larger veins are practically glabrous.

As an excuse for this statistical treatment, I may cite the statement of Jones (p. 110) that much of the practical identification and classification of *Tilia* must be made on the amount and kind of pubescence, particularly on the underside of the leaves. Probably this statistical method is not the best one, but cutting and counting is not as difficult as it might seem. Perhaps the pattern of veining of the upper surface of the leaf would be more adaptable. At any rate, I have begun at the beginning, as Fernald would say, and the different opinions of capable botanists and the variations observed by them in these leaf structures, shows how difficult the subject is. I have accumulated notes and sketches of several specimens in the Paris Herbarium, and I have gone over casually the specimens of *T. neglecta* in the Gray Herbarium. I do not have the inclination to pursue the subject further. — Osterville, Mass. 02655.